

G3ZME  
G6ZME

# News Letter

# TDARS

TELFORD AND DISTRICT AMATEUR RADIO SOCIETY



[www.TDARS.org.uk](http://www.TDARS.org.uk)

Issue 281



[www.TelfordHamfest.co](http://www.TelfordHamfest.co)

Dec. 2017- January 2018



[www.TDARS.org.uk](http://www.TDARS.org.uk)

## Programme

[www.telfordhamfest.org.uk](http://www.telfordhamfest.org.uk)

- November 29** "Rechargeable Batteries" - Brian G6UDX explains all
- December 6** Committee Meeting & GX3ZME on the air
- December 13** Mince Pies & Mulled Wine —LWVH. Ex-RSGB President Dave Wilson M0OBW also coming to tell us about the On-line Exams Progress.
- December 20** Christmas Meal—BOOK NOW : G0UFE—The Grazing Cow, Lawley
- December 27** No meeting—On The Air 144.600 MHz 2000 hrs (8pm Mr Mainwaring)
- January 3** Club Forum: What do you want or can offer to TDARS this year ?
- January 10** Committee Meeting & GX3ZME on the air
- January 17** "The Flying Laptop Satellite— onboard technology. Challenges & Opportunities" by Barry Cook G8PHG, guest speaker
- January 24** Winter Projects Update: #2 (Bring along whatever . . . )
- January 31** 10 Minutes Topics (or even 2 minute topics:)
- February 7** Committee Meeting & GX3ZME on the air
- February 14** Bowls Social Evening with the LWVH Bowls Club
- February 21** Contest & Portable Events Planning 2018. Also short talk/video
- February 28** Under-a-Fiver construction competition. Those little projects. . . .

**For Amateur Radio Exam Training—enquiries to Mike G3JKX (01952 299677)**  
**For Morse Training and Morse Proficiency Tests Martyn G3UKV or Eric M0KZB.**  
**For Equipment Loans & Returns contact Don M0TBQ.**  
**Radio Amateur Exams- Latest: [www.tdars.org.uk/html/training.html](http://www.tdars.org.uk/html/training.html)**

VILLAGE HALL, MALTHOUSE BANK, LITTLE WENLOCK, TELFORD, SHROPSHIRE. TF6 5BG

## Editorial

As (hopefully) everyone knows, TDARS was announced as the National Winner of the RSGB “Club of the Year 2016” at the National Hamfest held in Newark at the end of September. As well as sharing a couple of photos taken at the presentation later in this Newsletter, I thought you may find it interesting to see the 6 pictures **taken in 2016** which formed an important part of our entry last January, together with the accompanying captions. ***Well done all concerned !***



## The Hamsters hard at work



Shannon M6CFP (age 14)  
winner of two construction  
competition trophies at AGM



GB100TVC (Tern Valley Cubs)  
under canvass. All 450 of them!



## Our very busy Hamfest—September



Bob, G3ORY gives prior guidance at an HF DF exercise.



GB8MD. International Marconi Day  
at Tywyn, Mid-Wales.

**TELFORD & DISTRICT AMATEUR RADIO SOCIETY**

**CHAIRMAN:** Eric Arkinstall M0KZB (01743 240286)

**VICE-CHAIRMAN:** Martyn Vincent G3UKV (01952 255416)

**SECRETARY:** John Humphreys M0JZH (07824 737716)

**TREASURER:** Jim Wakenell G8UGL (01952 684173)

**CURATOR** : Don Nicholls M0TBQ (01952 411680)



**NEWSLETTER EDITOR:** Martyn Vincent G3UKV (01952 255416)

**PUBLICITY/WEBMASTER :** Dave G0CER (01630 638699 or 07971 416940, leave msg)

**Committee:** Simon G0UFE; Brian G6UDX; Paul M0PLA; Graham G7LMF; Village Hall Committee Liaison officer Martin 2E0TRO. QSL Manager Paul M0PNN; Assist Curator: Mike G6DFD; Trophies/Certs: Martyn G3UKV.

[illegible]

**From Mike G6DFD ..... Origin of RG as in RG-58 COAX CABLE**

**RG means "Radio Guide" and was the original military specification for coax cable, starting in the 1930s. So what do all the numbers mean ? RG-6, RG-8, RG-58, RG-59, RG-62, RG-122, RG-213, RG-405 and on and on?**

**The number is just a page in a book. RG-1 was the first page (and obviously wasn't a very successful cable design). RG-6, the sixth page, was wildly successful. Most CATV/broadband cable these days is RG-6.**



# Qtc: News & Information



**TDARS MEETINGS EVERY WEDNESDAY AT LITTLE WENLOCK VILLAGE HALL UNLESS INDICATED OTHERWISE ON THE FRONT PAGE PROGRAMME. ROOM BOOKED FROM 7PM - 10PM.**

**If Junior Hamsters group meeting, please do not enter before 7:45pm MEETINGS USUALLY COMMENCE AT 8PM**

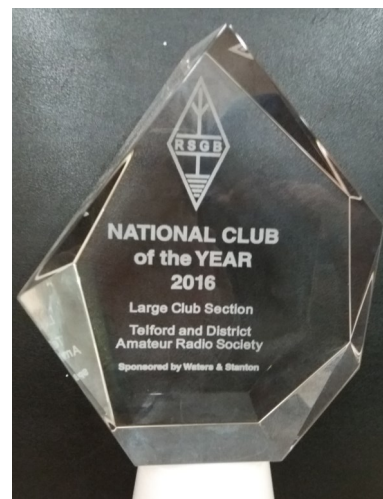
**Please note: A current membership card must be shown to borrow TDARS equipment. Please return borrowed equipment promptly .**

## **GX3ZME is activated every month by Mike G6DFD and others**

whilst the Committee is in session, usually on the first Wednesday of the month—but note the exception for January 2018, when the committee will be meeting on the second Wednesday, so that it can discuss the outcomes of the previous week's TDARS FORUM. Mike and others set up the station in the annex area by the kitchen, and mostly operate on VHF/UHF/Repeater, since HF is now so noisy (QRM) on the HF bands at LWVH.

Jim has circulated a **list of TDARS Members**. Please let Jim know if your callsign or name is missing, or if you've not recently informed him of any detail changes (callsign, address, phone nr, email). As Jim (G8UGL) reminds members—he's not a mind reader !

2E0KDF, 2E0KLS, 2E0TRO, 2E1DYL, 2E1HTU, G0ASP, G0CER, G0HCT, G0OOQ, G0RQI, G0UFE, G3JKX, G3UKV, G4NKC, G4YDT, G6DFD, G6UDX, G7ACD, G7LMF, G8AQA, G8UGL, G8VZT, GM3YEW, M0FHM, M0HMO, M0IRS, M0JZH, M0KZB, M0PLA, M0PNN, M0RJS, M0RKY, M0TAW, M0TBQ, M1FGN, M6JAX, M6LLO.



The new cut glass **2016 Club of the Year Trophy**, presented at Newark by the President of the RSGB to those club members present, is pictured above, complementing the C o t Y trophy 2011 shown below. Both are on permanent display, together with the accompanying certificates, at LWVH HQ. You can just see one of the



'TX Factor' camera crew on the L/H side, who later interviewed Martyn 'UKV and may appear on a later TX Factor programme. Also Jeff Waters, MD of Waters & Stanton, just behind Eric 'KZB.

Photos by Dave G8GKQ (of BATC) and Bob M0RJS respectively.

Outside afterwards. . . .



**Dave, G0CER** has sent in the following report:- (slightly edited—Ed)

I'm really pleased to come second in my section for **the IOTA contest** (beaten by IT9BTI). I entered Fixed IOTA station / Single Operator /Unassisted (eg not DX clusters) /SSB only/ 24hour / Low power (eg <100w) section.

Another great use of my Comet H-422 antenna and an inverted L wire for 80m.

I think Paul 'PNN entered - how did you get on? IOTA. For anyone interested in giving IOTA contest a go next year there is a 'newcomers' section entered by 12 stations this year. It's the last weekend of July, 24 hours 13:00 Sat to 13:00 Sunday. Lots of people go especially to some rare islands to activate them for the contest. Most of the UK comes under the island ref EU-005.

On the topic of Contests, the **TDARS microwave Group G3ZME/P overall winners** for the 2017 series of microwave contests, as follows. **5.7 GHz** G3KEU (Tim Leighfield SK) Trophy, scoring maximum (normalised) score of 3000 points.

**10GHz** G3RPE (Dain Evans SK) Trophy, scoring 2985 (normalised) points.

So looks like another trip to Martlesham (Suffolk) next spring to collect these trophies. Ops. were Jim G8UGL, Mike G4NKC, Kevin G8UPF and Martyn G3UKV. Also, Paul 'AQA and Heather 'HMO made the trip up the hill on two occasions, once on foot!

And yet **another award—this time for Heather M0HMO**, who was persuaded to enter the Construction Competition at the October RSGB National Convention in Milton Keynes. She won it for her Power and VSWR meter, which also featured at the Telford Buildathon (G-QRP event) in September. Great news, Heather—well done ! A slightly modified PCB layout version of the original is currently being constructed by several TDARS members. The presentation from a guy at M L & S is being made by Nick Henwood, RSGB President. (photo: John M6JAX)



Martyn G3UKV is looking for support to run **GB17YOTA on Friday 29th December**, from Longdon-on-Tern Village Hall, just north of Wellington. (TF6 6LE).. This is an annual event in the UK, and is for **2017 Youngsters On The Air**. It is intended to operate HF bands, plus possibly V/UHF during daylight hours, using club equipment. Some other 'hands on' activities are planned, with an emphasis on adults bringing their Junior Ops along during the day for an hour or two.

It's probably not too late to book your **TDARS Christmas Dinner** at the Grazing Cow at Lawley. This is a newish pub, which has established a good reputation for itself. There is a good choice of menu, with 3 courses set at £16.99 and 2 courses at £14.49. Contact Simon G0UFE.

Thanks to John M6JAX, the edited **HamFest talk by Dom Baines M1KTA** "Antennas on DX" was played back to members successfully. So members didn't miss his presentation after all

Note: **No TDARS meeting at LWWH on December 27**, but how about meeting up for a few minutes on 144.600MHz FM that Wednesday evening at 8pm ? Or GB3TF ?

**Thanks for Newsletter input this time:**

**Heather M0HMO, Brian G6UDX, Mike G6DFD, Graham G7LFM,**

**Dave G0CER, Bob M0RJS, John M6JAX, Jim G8UGL**

**Next edition mid January: Please keep it coming-contributors make the difference!**



## Low Voltage Power Lead Labelling—by Brian G6UDX

Many pieces of low voltage DC equipment are powered through concentric power leads. Some members may still have equipment in use that uses the less common centre negative. (eg The old Yaesu FT290/790R all-mode portable series of Trcvrs—Ed). Not all equipment is provided with polarity protection diodes. Without these diodes catastrophic damage can be inflicted by reverse polarity. To minimise the likelihood of mistakes, when I make up leads of this type, not only do I include a label under clear heat-shrink stating either positive or negative centre I also differentiate them by colour by using Black/Red for the more common centre positive and



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## Jamboree On The Air (JOTA) 2017—by Graham G7LMF



Jamboree On The Air (JOTA) is an annual, worldwide activity weekend for scouting around the world. It is the largest Scouting event in the world with over 1 million Scouts participating across 150+ countries.

It all started back in 1957 when a World Scout Jamboree was held at Sutton Park in central England, with 35,000 Scouts from 62 countries attending. For the first time at any World Jamboree, local radio amateurs installed and operated a large radio station under the call sign GB3SP. Scouts and leaders were allowed to visit, as long as they stayed behind the little fence with the flower pots and kept the noise down.

Les Mitchel, G3BHK, (9 December 1923 – 6 October 2014), a British Scout leader at the time, writes: “I was very surprised by the number of overseas Scout radio amateurs attending the Jamboree and decided that some effort should be made to bring them all together. A notice in the Jamboree Newspaper resulted in daily coffee meetings during which we got to know each other and had a good rag chew.

The meetings were actually held in a snack bar outside the Jamboree gate, as meeting in the GB3GP radio station would produce too much “background noise” for the operators.

Towards the end of the Jamboree we were all a little sad at our impending departure, and someone casually remarked that we might try to contact each other on the air. This then developed into the idea of trying to make contact on one specific day in order to concentrate our efforts, and I was asked to make the necessary arrangements". Unknowingly, Les G3BHK became the founding father of JOTA.

TDARS has been helping 2<sup>nd</sup> Wellington Scout Group since 2011 to put on the event for the whole of Tern



Valley Scout District (the District covers everything in Shropshire north of the M54 and east of the A49 (plus Wem) and as 2017 saw the 60<sup>th</sup> birthday of JOTA and as with every year for the previous 59 years the 3rd weekend of October saw the annual Scouts Jamboree On The Air (JOTA) and for the 6th year running I arranged for members of TDARS (Eric KZB.

Martyn UKV, John JZH, Martin TRO, Don TBQ, Simon UFE and Paul PLA) to set up an amateur radio station for the 2nd Wellington Scout Group.

This year we returned to the 2<sup>nd</sup> Wellington Scout hut in Wellington and the original format of a HF station and a VHF station.

Because it was the 60<sup>th</sup> birthday of JOTA we changed our usual GB2WSGcall sign for a SSSES (Special Special Event Station! – Ed) namely **GB60WSG**.

Simon, Don, Eric, John and myself all took our turn running the radios and although the bands were not very good (only 29 contacts made on HF and 19 on VHF!) but we did make some good contacts including 9 Scout groups (1 in Holland) and 2 contacts into the USA by John.



A morse practice table was manned throughout the weekend by Martyn UKV, Eric KZB, Paul PLA and Martin TRO.

The weekend's activities were well received by the youngsters.

As is always the case, the youngsters had a great time and I think that the TDARS members present also enjoyed themselves (in a masochistic way?)



**And the significance of the first picture? Well it was a birthday, so there had to be cake !**

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# **Adventures With the RTL-SDR: Receiving Amateur Satellites on 2metres—** *by Heather M0HMO*

# Introduction

There are now quite a few (more than 10 anyway) satellites up and active on 2m and are transmitting telemetry ranging from just their call sign to detailed experimental information. Many of them have applications programs that you can run on a Windows PC to interpret the RF signal and turn it into meaningful data about the satellite and the experiments that are on it. Some even allow you to send the data back to a data warehouse so that others can benefit from the science data you have collected.

First among these must be the FUNCube. One of the many 10x10x10 cm satellites put up specifically for amateurs. The only requirements to receive this and most of the other 2m satellites are the £6 RTL-SDR, a vertical 2m antenna with a good view of the sky and a PC with some free software installed on it. You don't need fancy polarised antennas, rotators, Az/EI. Positioners. Doppler trackers and so on.

Assuming you have got your RTL-SDR up and running (see previous article for details on how to do that) then you are only a few minutes work away from receiving signals from space. Here's how!

## Equipment

- \* RTL-SDR radio (inc. USB cable to PC)
- \* Windows PC
- \* Vertical antenna for 2m with suitable adaptors to connect to your RTL-SDR.
- \* 2m filter (optional – but might be useful if you have bad QRM in your area)
- \* SDR# software
- \* Audio pipe software
- \* Decoder software for your satellite (if required)

## Finding the satellite to receive

There are a number of resources you can use to find when satellites are coming overhead, I use:

<http://www.n2yo.com/passes/amateur-radio.php>

Satellite Predictions Passes

www.n2yo.com/passes/amateur-radio.php

N2YO.com Tracking 18839 objects as of 15-November-2017  
HD Live streaming from Space Station  
1,499 objects crossing your sky now

ISS will cross your sky in 9h 6m 41s

Find a satellite... Search  
N2YO.com on Facebook Advanced

Home Most tracked Just launched Satellites on orbit Alerting tools More stuff Logout

#### Amateur radio satellite passes for the next 6 hours

The list includes amateur radio satellites known as "active".  
Only passes with max altitude above 20 degrees have been displayed.  
The information regarding frequencies, modes and call signs has been retrieved from [JE9PEL web page](http://JE9PEL.web.page).  
Place your mouse over the beacon frequency to learn more about the satellite.

UTC		Satellite		Start		Max altitude		End		All passes
Name	Beacon (MHz)	Downlink (MHz)	Local time	Az	Local time	Az	Ei	Local time	Az	Info
BUGSAT 1		437.445	12:44	S 187°	12:48	W 259°	44°	12:54	NNW 341°	<a href="#">Track it</a>
BISONSAT		437.375	12:44	NE 34°	12:44	NE 34°	37°	12:50	ESE 111°	<a href="#">Track it</a>
BEEFAT 2	435.950	435.950	12:44	NE 60°	12:44	NE 60°	45°	12:49	SE 120°	<a href="#">Track it</a>
MCUBED-2	437.479	437.485	12:46	NE 56°	12:53	S 190°	88°	13:00	SW 238°	<a href="#">Track it</a>
FOX-1A (AO-85)	145.980	145.980	12:49	NW 317°	12:55	NE 35°	39°	13:02	ESE 112°	<a href="#">Track it</a>
OSCAR 7	29.502	29.400-29.500	12:51	SE 121°	13:01	NE 51°	39°	13:12	NNW 340°	<a href="#">Track it</a>
ESTCUBE 1	437.254	437.505/2401.250	12:55	N 8°	13:01	WNW 297°	32°	13:08	SW 225°	<a href="#">Track it</a>
OSCAR 19 (LUSAT)	437.125	437.125/437.150	12:58	S 173°	13:05	W 260°	63°	13:13	NNW 343°	<a href="#">Track it</a>
M-CUBED/EXP-1 PRIME	437.502	437.505	13:11	SSE 155°	13:16	E 78°	83°	13:22	NNW 340°	<a href="#">Track it</a>
DX 1	438.225	434.975-435.025	13:17	NNE 23°	13:24	E 27°	27°	13:30	S 160°	<a href="#">Track it</a>
SOMP	437.503	437.485	13:20	NW 311°	13:26	SW 239°	32°	13:32	S 166°	<a href="#">Track it</a>
OIOREOS (USA 219)	437.300	437.305	13:29	S 178°	13:35	ESE 106°	31°	13:42	NE 36°	<a href="#">Track it</a>
SPROUT	437.525	437.525	14:01	N 6°	14:07	WNW 299°	26°	14:13	SW 231°	<a href="#">Track it</a>

Look for the ones with 2m beacons then do a web search in Google for each one to check on the frequencies that it uses and what format it is sending data out.

### Basic Setup

You need to install SDR#. This was covered in a previous Newsletter. Connect up your antenna and you are ready to go.

### Receiving CW

If you want to receive CW only (E.g. First-Move, the XW-2 series etc.) you don't need anything else to decode them. Just tune into the frequency where you expect the satellite to be (in SDR#) and you should see the transmissions in the waterfall.

Recording \*

Status

File Size 0 MB

Duration 00:00:00

Dropped Buffers 0

Mode

Sample Format 16 Bit PCM

Audio ☐ Baseband ☒

Record

It is often easiest to set SDR# to receive USB rather than CW and then listen to the output and fine tune it for your ears. If you don't know morse then all is not lost as you can easily decode it later using the SDR# record baseband option.

Note that these files are big (can get into the GByte range). Also, the recording is limited to 4 minutes or so. I tend to keep recordings going for the whole of the pass and then delete ones

with nothing relevant.

You can change the speed of the waterfall to make the morse easier to see with the FFT Display options:

FFT Display

View Both

Window Blackman-Harris 4

Resolution 65536

Spectrum Style Static Gradient

☐ Time Markers Gradient

☐ Mark Peaks

Smoothing

S-Attack

S-Decay

W-Attack

W-Decay

Spectrum

Speed

### Installing VB Cable

For many RTL-SDR applications, you will also need to install a program that will take the audio output of the SDR# program and put it into the audio input of a decoding program.

One good solution is the VB –Audio Cable. This is a virtual cable (i.e a piece of software) that you can “plug” into the audio output of one program and then “plug” into the audio input of another. Just as you would do between an audio source and an amplifier. One advantage of this is that it can support a lot of different audio sample rates whereas other solutions are limited to what the computer supports natively. You can download this from:

<https://www.vb-audio.com/Cable/>

Install it and, when you look at your PC's audio devices, you should now see a Cable Input in the list of Playback devices (along with your speakers etc.), and also a Cable Output in your Recording devices (along with microphone. Line-Ins etc.).

SDR# v1.0.0.1430 - IQ File (\*.wav)

000.145.960.000

Anti-Fading ☐ Swap I & Q ☐

Audio

AGC

FFT Display

View Both

Window Blackman-Harris 4

Resolution 65536

Spectrum Style Static Gradient

☐ Time Markers Gradient

☐ Mark Peaks

Smoothing

S-Attack

S-Decay

W-Attack

W-Decay

Spectrum

Speed

Audio Noise Reduction \*

IF Noise Reduction \*

Noise Blanker \*

Recording \*

Status

File Size 0 MB

Sound

Playback Recording Sounds Communications

Select a playback device below to modify its settings:

Speakers

Realtek High Definition Audio

Default Device

Realtek Digital Output

Realtek High Definition Audio

Not plugged in

CABLE Input

VB-Audio Virtual Cable

Ready

Configure Set Default Properties

OK Cancel Apply



## Receiving FUNCube Telemetry

For the FUNCubes (there are 3 of them up at the moment: FUNCube-1 (AO73), FUNCube-5 (EO88) on NAYIF-1 and FUNCube-2 on UKube-1) you will need to install software to decode their data into something meaningful. You can download the software from:

<https://funcube.org.uk/working-documents/funcube-telemetry-dashboard/>

You need to register with the warehouse as well (from the same site). They will send you a confirmation email and an authorisation number that you will need to fill into the program. You also need to download their example .wav files to test the setup on.

\* Install the software (double click on the MSI file). You will need to set up the program.

\* In **File/Settings/warehouse** (click the tab). Enter the authorisation code and also make sure that **Stream data to warehouse** is **NOT** ticked. Click save at the bottom.

\* Go into **audio tab** and select **Cable Output** as the input device and save. (Note the VB cable output is being connected to the audio input).

\* On **capture** menu select **capture from Soundcard** (this is so that we can do a dry run with a test file)

\* Make sure **Monitor Audio** is checked (bottom left of screen)

\* Make sure **autotune** is ticked as well.

Audio	Warehouse	Files
Site Id	M0HMO	
Auth Code	PeprTz6luz3Jalm6zMRC	
URL	http://data.funcube.org.uk	
Stream data to warehouse	<input type="checkbox"/>	

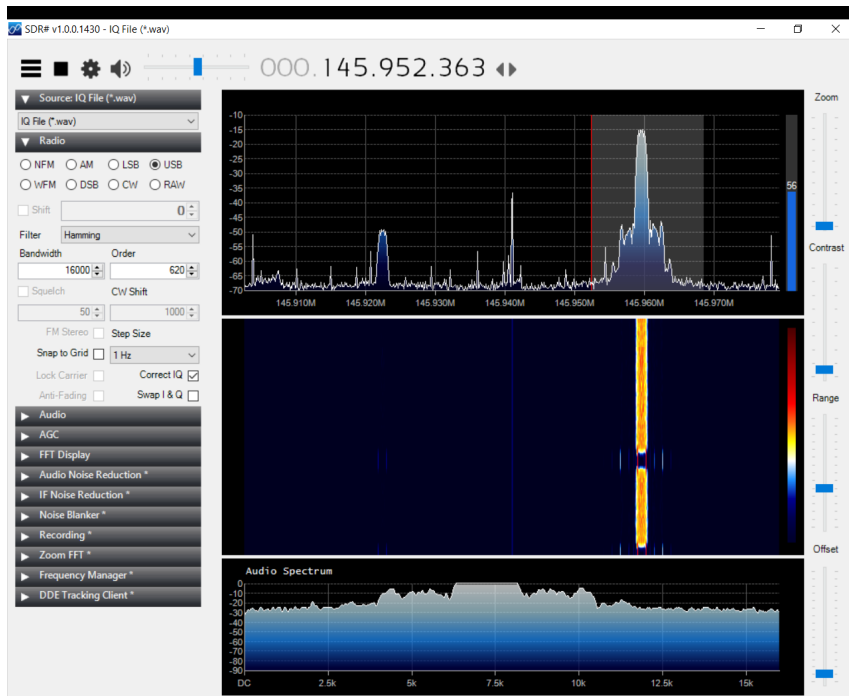
Audio	Warehouse	Files
Input Device	CABLE Output VB-Audio Virtual	
Output Device	Speakers Realtek High Definiti	
Frequency preset	FUNCube-1 Flight Model	
FCD Centre Frequency (kHz)	145925	( 145877 kHz to 145973 kHz )
FCD Enable Bias T	<input checked="" type="checkbox"/>	

\* Go look at the RealTime screen and you should see a section marked "Decoding" and in this "Error Count" - this should be 0 when it is all working well.





- \* Now Run SDR#
- \* Select **VB cable input** as the output device
- \* Select **IQ file (.wav)** In the Source. An "open" dialog will appear and you can select the example file you downloaded earlier EMrecordg1\_20130922\_193609Z\_145941kHz\_IQ.wav)
- \* Make sure you have ticks in USB and CORRECT IQ boxes.
- \* Settings are USB, 16000Bandwidth, 620 Order
- \* Hit play (the little triangle top left of the SDR# screen). When you can see the signal in the waterfall set the frequency marker (the vertical red line) so that it is to the left of the signal like this:-



\* Back on the FUNCube Program window, you should see it lock onto the signal (the fuzzy green vertical line at the bottom should be centred on the peak) and the screen will show the decoded signal!

The next step is to actually receive the live signal.

Go back into the FUNCube program settings and tick the **Stream data to warehouse** box so that your data will be sent up to the data warehouse.

Wait until the N2YO program tells you FUNCube -1 is in range (the start of the pass) and go look at the signals coming in. The distinctive broad band followed by occasional 2 tone sections can be quite easily recognised. Move the RX frequency until it is covering the signal and you should see the FUNCube program decode it.

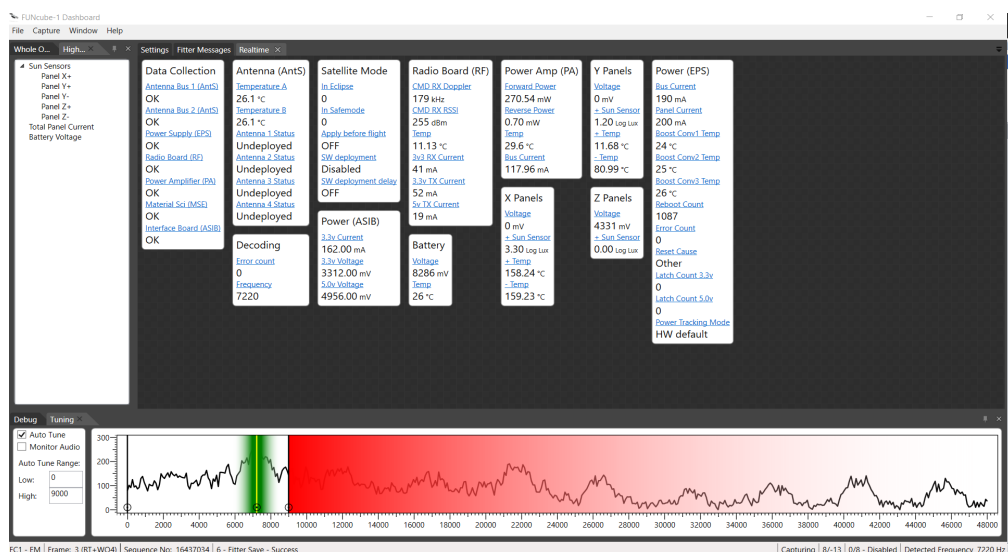
## Contributing and certificates

Everyone who contributes data will get their callsign on the rankings list. Have a look at:

<http://warehouse.funcube.org.uk/ranking.html?satelliteid=2>

With luck you should see your callsign once you have successfully uploaded data. You can then download a SQL card and certificate of achievement to put on your wall!

[http://amsatuk.me.uk/on/funcube\\_qsl.php](http://amsatuk.me.uk/on/funcube_qsl.php)



## Next Steps

Their same program will decode **all 3 FUNCube satellites** and send the data to the correct warehouse. It won't show you the data on the screen unless you have installed the right program for that specific FUNCube though.

Also out there are the FOX satellites, (FOX-1A is up there already, FOX-1B is scheduled for Launch soon).

There is a different program to get to decode these transmissions but it isn't hard to get it working once you have mastered the FUNCubes.

